

WHAT IS CLAIMED IS:

1. A non-aqueous electrolyte secondary cell comprising:

a cathode employing a cathode active material containing a compound of the olivinic structure having the formula $\text{Li}_x\text{Fe}_{1-y}\text{M}_y\text{PO}_4$, where M is at least one selected from the group consisting of Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B and Nb, with $0.05 \leq x \leq 1.2$ and $2.0 \leq y \leq 0.8$;

an anode; and

an electrolyte solution; said cathode, anode and the electrolyte solution being housed in a container; wherein

the amount of said electrolyte solution is adjusted to provide a void in said container of not less than 0.14 cc and not larger than 3.3 cc per 1Ah of the cell capacity.

2. The non-aqueous electrolyte secondary cell according to claim 1 wherein said cathode active material contains a composite material of said compound and a carbon material.

3. The non-aqueous electrolyte secondary cell according to claim 1 wherein said anode contains a carbonaceous material as an anode active material.

4. The non-aqueous electrolyte secondary cell according to claim 1 wherein a strip-shaped cathode material and an anode material are layered together via a separator and are wound a plural number of times to form a cell device, said cell device being housed in a cell can as said container.

5. The non-aqueous electrolyte secondary cell according to claim 4 wherein said cathode material includes a cathode current collector on each side of which a layer of a cathode active material containing a cathode active material is formed and wherein said anode material includes an anode current collector on each side of which a layer of an anode active material containing an anode active material is formed.

6. The non-aqueous electrolyte secondary cell according to claim 5 wherein said layer of the cathode active material is formed of an LiFePO_4 carbon composite material composed of said compound and a carbon material.

7. The solid electrolyte cell according to claim 6 wherein the carbon content per unit volume in said LiFePO_4 carbon composite material is not less than 3 wt%.

8. The solid electrolyte cell according to claim 6 wherein the carbon material of said LiFePO_4 carbon composite material has a strength to area ratio of a diffraction line appearing at the number of waves of 1570 to 1590 cm^{-1} (G peak) to a diffraction line appearing at the number of waves of 1340 to 1360 cm^{-1} (D peak) of the Raman spectrum in Raman spectrometry, or $A(D/G)$, equal to 0.3 or higher.

9. The solid electrolyte cell according to claim 6 wherein the powder density of said LiFePO_4 carbon composite material is not less than 2.2 g/cm^3 .

10. The solid electrolyte cell according to claim 6 wherein the Bullnauer Emmet Teller specific surface is not less than $10.3\text{ m}^2/\text{g}$.

11. The solid electrolyte cell according to claim 6 wherein the first-order particle size of said LiFePO_4 carbon composite material is not larger than $3.1\text{ }\mu\text{m}$.

12. The solid electrolyte cell according to claim 1 wherein said non-aqueous electrolyte is a non-aqueous electrolyte solution composed of an electrolyte dissolved in a non-aqueous protonic solution.

13. The solid electrolyte cell according to claim 1 wherein said non-aqueous electrolyte is a solid electrolyte.